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## **Testing possibilities of Sentinel 1 data for yield forecast**

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2020

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# PRAGUE INSPIRE HACKATHON 2020

Challenge: 7

Team: Iva Batrlová, Jana Seidlová

Mentor: Jiří Kvapil

# Challenge

- 7. Testing possibilities of Sentinel 1 data for yield forecast

Why Sentinel-1?

- It is not dependent on cloud cover, weather, or part of a day
- Global coverage with temporal resolution of 6 days



# Our plan

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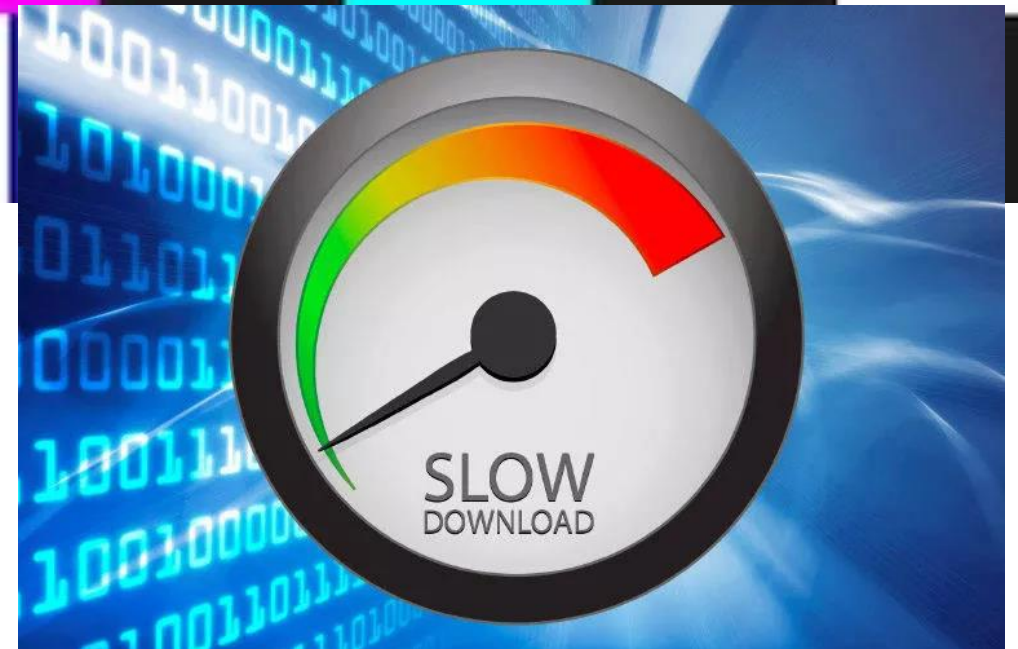
- NDVI (optical) data download
- Sentinel-1 (radar) data processing
- NDVI and SAR backscatter correlation
- Evaluation of results



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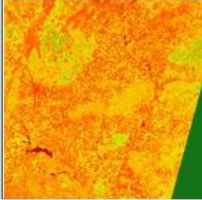

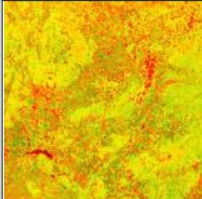

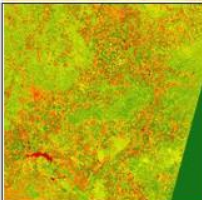

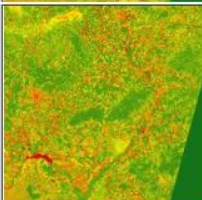


Your PC ran into a problem that it couldn't handle, and now it needs to restart.



# Optical data – (Normalized difference vegetation index) NDVI

Rok:  
 2019  
 2018  
 Maximální oblačnost (%):

Družice	Náhled	NDVI	Scéna	List	Dráha	Oblačnost	Datum
Sentinel-2B			<a href="#">S2B_MSIL2A_20180322T100019_N9999_R122_T33UXQ_20190616T092620</a> <a href="#">NDVI</a>	33UXQ	122	2.967350	2018-03-22
Sentinel-2B			<a href="#">S2B_MSIL2A_20180418T095029_N9999_R079_T33UXQ_20190616T045959</a> <a href="#">NDVI</a>	33UXQ	79	17.621435	2018-04-18
Sentinel-2B			<a href="#">S2B_MSIL2A_20180421T100029_N9999_R122_T33UXQ_20190616T043627</a> <a href="#">NDVI</a>	33UXQ	122	0.229332	2018-04-21
Sentinel-2A			<a href="#">S2A_MSIL2A_20180506T100031_N9999_R122_T33UXQ_20190616T041256</a> <a href="#">NDVI</a>	33UXQ	122	1.385017	2018-05-06





## South Moravian region

- Silage corn
- Winter wheat

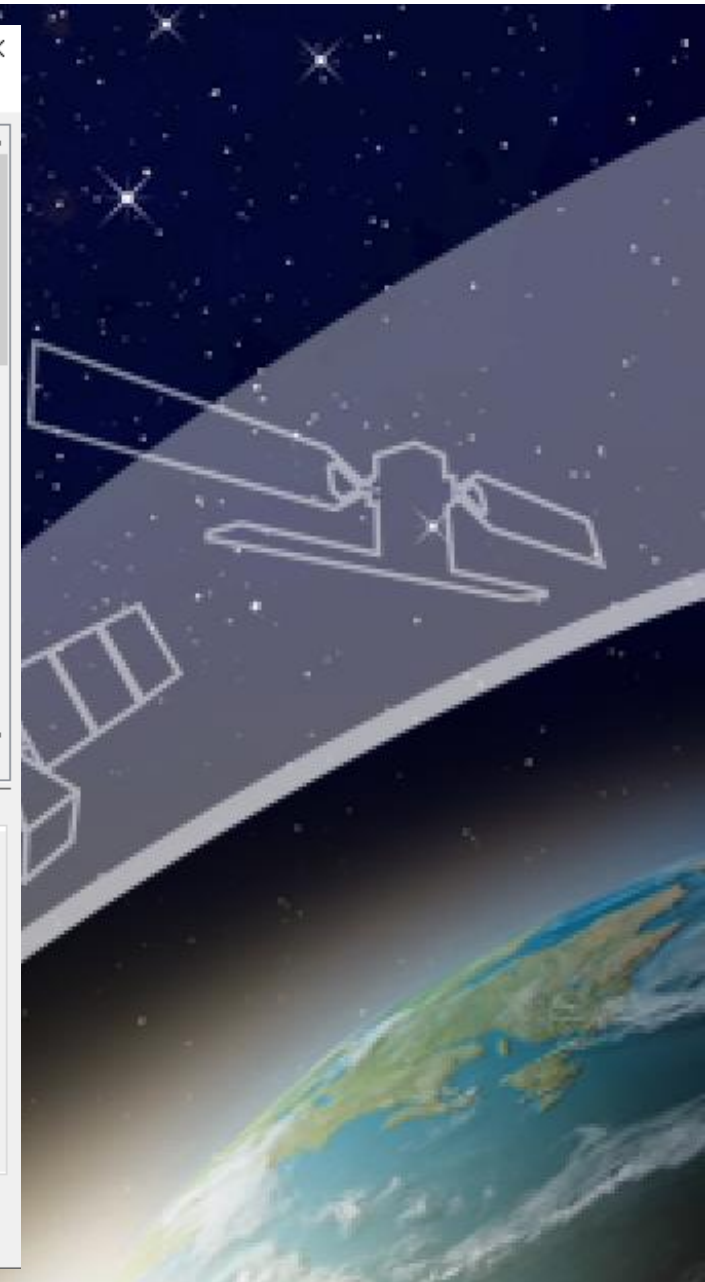
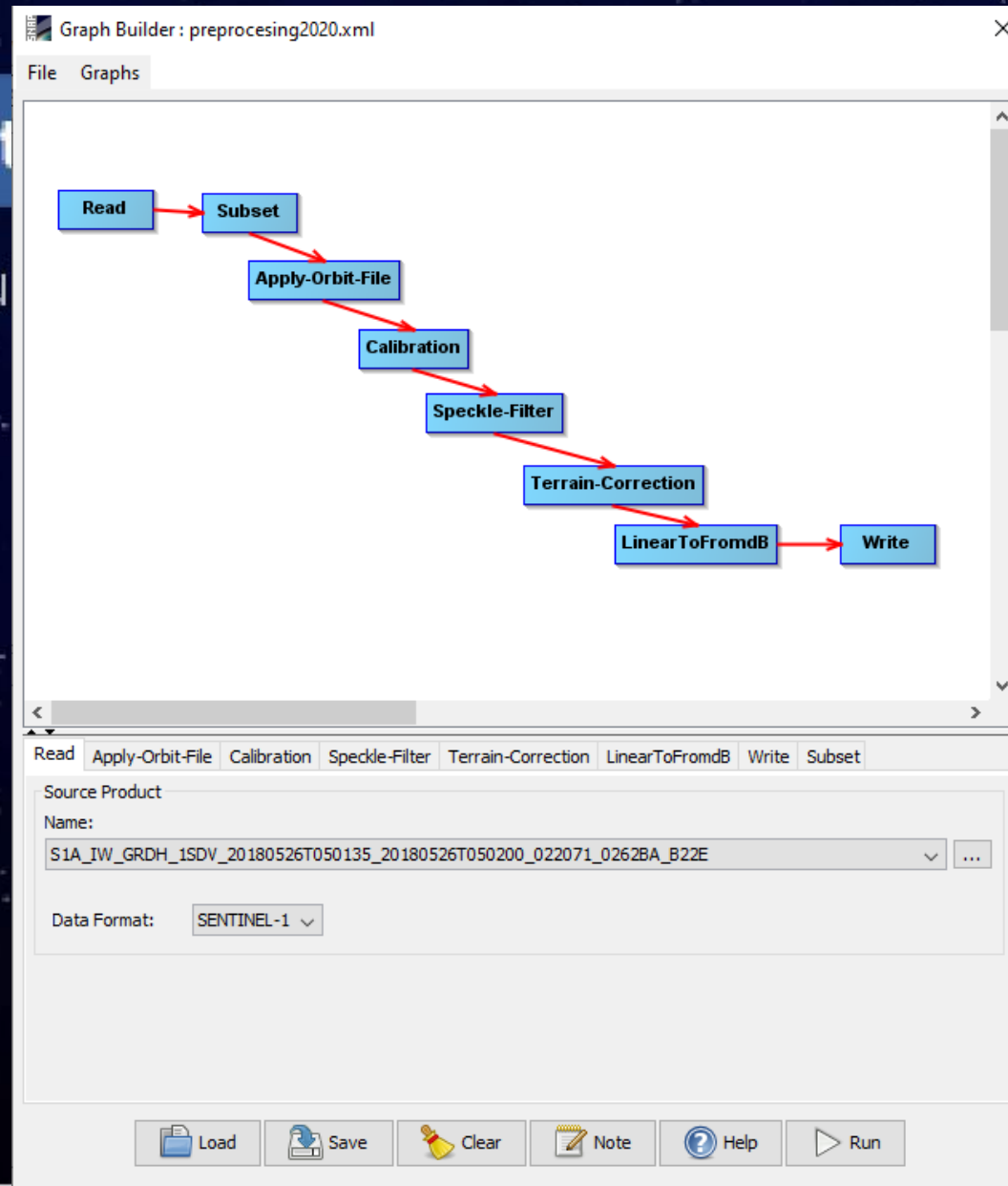
# Processing of Sentinel-1 SAR data

→ SNAP | Sent

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of operational missions





# NDVI and SAR backscatter correlation

## Silage corn

Date	NDVI	VH polarization	VV polarization
2018_08_04	0,6871	-16,68705177	-9,183225632
2018_08_01	0,74499	-17,46385574	-9,774157524
2018_05_26	0,44141	-15,98784733	-10,63175011
2018_05_13	0,26052	-19,89326286	-14,62134457
Correlation		0,564291137	0,903557882

## Winter wheat

Date	NDVI	VH polarization	VV polarization
2018_06_30	0,259948	-16,55436707	-12,23000908
2018_06_02	0,71788	-19,97186852	-16,66276741
2018_05_26	0,880837	-19,48394012	-16,09407616
2018_05_21	0,87757	-20,07376862	-17,07854652
2018_05_13	0,881333	-18,34368324	-12,89525032
Correlation		-0,800499812	-0,591871121

A dark blue, irregularly shaped graphic with a splatter effect, containing the text "Thank you!" in white. The graphic has a rough, hand-painted appearance with various shades of blue and white splatters around its edges. The text is centered within the dark blue area.

Thank you!